

THE  
BOSTON MEDICAL AND SURGICAL JOURNAL.

VOL. LXXI.

THURSDAY, OCTOBER 6, 1864.

No. 10.

PHAGEDÆNA.

[Communicated for the Boston Medical and Surgical Journal.]

It is not very probable that the true cause of this disease will ever be definitely known; and in the absence of clearly proved and incontrovertible facts which would establish its real nature, it matters little how opinion falls into line for, or against any special theory. However, enough has been ascertained to prove that the most favorable *conditions* for its development are to be found in a badly kept, badly ventilated *ward*, crowded with wounded soldiers; and but for its occasional occurrence in outside patients, and in the clean wounds in finely conducted wards, where filth and foul air have no place, the mystery enshrouding its birth would not appear so profound. Under this shadow we will have to leave the secret of its creation, submitting to be consoled for unrewarded research by the pleasant reflection that we are always able to identify the invader, and to bring powerful and efficient means for its destruction. Hideous, foul and terribly destructive as is phagedæna when left to itself, or improperly treated, yet there is no severe malady wherein remedial interference is followed so rapidly by such astounding improvement. One great element of success over older practice is the great superiority of hospital hygiene at the present day, rendering the great majority of cases more mild and controllable. Timely interference has much to do in the per cent. of recoveries.

*Symptoms.*—There are three symptoms which attend every stage of phagedæna, by which it can always be easily recognized; viz., a *quick pulse*—extremely rapid in grave cases—*ulceration*, and a *foul, sickening odor*. It ought never to be confounded with any other disease. It has been my lot, however, to have seen some of the most frightful though beautifully characteristic cases occurring in private practice confounded with phlegmonous erysipelas—a thing unpardonable, inasmuch as the recollection of a single circumstance will always be

VOL. LXXI.—No. 10

sufficient to separate these diseases, viz., that in phlegmonous erysipelas there is *immense swelling, heat and tension of the parts before supuration and sloughing set in.*

The "quick pulse"—beginning with the symptoms in the order they are named—is, as far as my observations have extended, the result of the local ulceration and infection, though both may be present in the morning, having taken possession of the patient some time in the night, when it is hard to say which had the precedence. Cases of this description have occasionally come under my observation; however, I am inclined to the opinion that in these cases the wound had not been carefully examined the evening before, when, if not a minute slough, at least a *bad odor* would have been detected. At times the wound will have a very disagreeable smell, though *well dressed*, for several days before any local or constitutional symptoms of phagedæna manifest themselves; and this unpleasant fœtor will not leave a wound when invaded by this malady, till the diseased action be *entirely destroyed*. As the disease advances, the pulse increases in frequency, hardly ever being less than 130 or 140 to the minute, and generally, in bad cases, as high as 160 and 170. If not very high, the patient is not very badly attacked, or only in the initiatory stage. With this pulse there is a peculiar hot and unpleasant skin; it rarely appears moist and relaxed. When this occurs after a vigorous local treatment, it is always a good augury, as the pulse soon falls to nearly a natural beat, when the patient becomes finely convalescent.

When the case terminates fatally, life is extinguished by asthenia. Towards the last, diarrhœa sets in, and the poor *nervous, tremulous* invalid, whose every feature has undergone some sharpening by incessant pain and sad apprehension, equalled only by the *shaking palsy* which has long since seized on all his frame, passes into the wanderings of fitful delirium, when death finally terminates the struggle, in the midst of more or less complete abolition of the senses. But he will not die as soon as is expected. These cases have a terrible habit of holding out long after they have become hopeless.

*Ulceration.*—This is peculiar, and comprises two grades, or modifications of ulcerative action; viz., *molecular* death, or ulcerative absorption, which is chronic in its course in comparison with the other, and affects only the integument, connective tissue and muscular aponeurosis of a part or limb; the other is somatic death, or mortification suddenly attacking the entire tissues of a "stump," or adjoining structures in other injuries, particularly in "gun-shot wounds," where an immense surface, or the entire extent, may become sloughy in a single night. This is popularly known as "hospital gangrene." It is most apt to occur in the flaps just after amputation in unhealthy or *diseased* wards; perhaps affecting only a corner of one flap, or involving portions of both, thence extending up to the stump, where it may halt after de-

stroying only its covering, or continue up the limb, committing fearful ravages till life becomes extinct. It is seldom that it quits a part *of its own accord*. Then, again, it may invade the tender granulations of a stump when it has almost recovered from the amputation, or is making beautiful advances, and open it all up again. Their causes are the same, only the latter is not of such frequent occurrence as formerly, owing, as I have already had occasion to remark, to the superior hygiene of the present day, which tames its ferocity. The simple ulcerative form is the one which will command nearly the entire attention. If it invades the granulations of a stump, the appearance of the ulcer differs somewhat from the one which is developed along the continuity of a limb, whether the orifice of entrance or exit of a musket ball or other projectile be the point of explosion or not. Such an event is announced by one or more points of soft, semifluid, yellowish, dirty slough, which is generally very well outlined on the field of granulations.

In the course of a few hours, if nothing be done to prevent it, the whole wound will have disappeared beneath this foul marsh. When attempt is made to remove it with sponge and water, part of it will smear the sponge, whilst the deeper portions will be found to be more firm and tenacious. It may be soft and friable under the fingers, or firm and dense nearly as fibrous structure; this is more apt to be the case in the very chronic forms of the disease, and particularly noticeable near the joints. As the ulcerative action advances, it may gradually consume the entire soft structures in the vicinity, the integument, slower in giving up, becoming much everted, whilst the segment of the bony structure, covered with scarlet granulations, juts out from the base of the disease; or after consuming portions of the muscles, it may presently abandon them, to devote its entire attention to the muscular sheaths, the areolar tissue and integument. When it presents in a breach of integumental continuity it affects primarily the superficial fascia and integument, creating abrupt and precipitous edges, which as they advance observe nearly a circular form. These edges are inflamed, red and swelled. If pressure be made upon them, thick foetid matter will well out; they are undermined to some extent, varying at different points. Presently the ulcerative action will have penetrated the fibrous aponeurosis of the muscles, dipping down between them to remove the areolar tissue, when they have a *clean, red, isolated* appearance; they are covered with granulations, which secrete no pus. When the dressings are being removed, a thick, ropy, mucous-looking secretion will sometimes, particularly when stimulants have been used, swag down in strings into the basin. As the disease advances, the bony skeleton is reached, and the rest of the limb *below* the ulcer becomes œdematous from the interrupted venous return, because of *solution of the veins*.

This form is sometimes idiopathic, particularly in the old, when it is terribly ravenous. I once saw a case in a tall female of nearly

fifty, where the integument and fasciæ had been consumed and the muscles stripped of their investments as high up as the thigh. She died some days afterwards. It commenced on the dorsum of the foot in the form of a large vesicle with a red base, which presently gave way, when destructive action set in. It will hardly be believed when I make mention that the attending physician called it erysipelas. The mephitic odor was very conspicuous.

I also remember a frightful instance of this disease in a farmer of upwards of fifty years; he was of medium size, and had previously enjoyed very good health. This also was preceded by an inflamed vesicle, which rose on the dorsum of the right hand. All integument, fibrous expansion and connective tissue had disappeared as high up as the middle of the deltoid muscle externally, whilst internally the interior border of the latissimus dorsi stood out red and naked. The brachial artery, with its ulnar and radial branches, hung down from the axilla like a rope, and was only kept in place by the muscular and articular branches that had remained entire. He also died; *all* such cases die. Let it be well understood that in these cases the tissues disappeared by *ulcerative absorption*. When the causative power becomes intensified, then *sloughing* sets in.

It is a most singular circumstance, that when amputation is had recourse to it occasionally substitutes the latter procedure, so that when the stump is uncovered to change the dressing the flaps are found cold and of a greenish livid color; it is hospital gangrene, and the case is now desperate: he rarely recovers.

The *last* of the symptoms, that of "foul odor," has already been much adverted to, and I am only tempted to allude to it again in connection with deep penetrating wounds, where it is of signal importance. Here we can see nothing that is going on, as the ulcerative action is far out of sight, and both the patient and medical attendant are sadly deceived. If active remedial measures be not immediately instituted, the patients *all die*. If a patient be found, several days after the infliction of deep gun-shot injury, with a quick pulse, and a *foul discharge*, whatever be its origin, phagedænic, erysipelalous or what not; if the entire track will not admit of opening up, or thorough cleansing to prepare it for an application which will destroy the putrescent tissues along the entire track, the case is a most forlorn one. It requires a bold hand to save these cases.

*Treatment.*—When this disease breaks out in a ward, it should be *immediately* cleared out—renovated—leaving the whole premises for the phagedænic cases only; and if these be many, or severe, it would be highly proper to remove some. They do well in tents, especially when there are not more than three or four to a tent, and I would respectfully recommend to the profession that this procedure be adopted whenever the tents can be obtained. Each case must be furnished with a *separate nurse, basin and sponges*. Community of dressings *must* be avoided by all means, and the nurses must be con-



stantly reminded of this fact. The sponges must be well cleansed every time with soap and water, and then scalded with hot water. After they have been used a while, it is *safest* to throw them away, making use of fresh ones.

The red-hot iron, as an application for the treatment of this disease, is still much in vogue in the Isles and on the Continent. In the form of the tinner's soldering iron, reduced to the size of an ounce weight, or expanded in acorn-like shape, it can be made to touch the bottom of every crevice, excavation and irregularity of the ulcers. It is an effectual remedy, *but by far too severe*. Enough of the tissues are very generally destroyed already to render recovery or deformity hazardous, and it is therefore highly important that, if found equally efficacious, a more conservative course should be adopted.

The treatment by fuming nitric acid is gaining many powerful friends both in Europe and America, and it is beyond a doubt a most excellent remedy; yet *it also creates too deep a slough*. It is applied by means of small pieces of sponge saturated with the acid, and firmly pressed over the surface and edges of the ulcer, previously well dried. Diluted with one third water, it answers much better.

In this country, bromine has suddenly taken a high position through the recommendation of Dr. Goldsborough. It is not liable to the same objections as the other methods, for it is followed by a *very thin eschar*; its remedial powers in this disease are also highly flattering. Yet it must be confessed, if only for the sake of the *uninitiated*, that it is decidedly the *meanest* and most *offensive* article ever recommended to the profession, inflicting great punishment upon the party attempting to apply it. The moment a vial is unstopped the surgeon's head is enveloped in a dense red cloud of suffocating fumes arising from the highly volatile liquid. Use either a small glass syringe, or a bit of sponge, or any other vehicle, still you cannot escape this punishment. Then another objection is, that it has such avidity for the tissues, spreading over them in such wild haste as to require great manipulative care to keep it within legitimate bounds. I have seen the hip and thigh denuded and deeply ulcerated over a space larger than a dinner plate, *caused*, it was averred, by the fumes alone, confined by the oiled silk which is generally used as a part of the immediate after-dressing. This deplorable case is sufficient in itself to show that great caution should be exercised in its application. Owing to the above reasons, I have discontinued its use.

In lieu of the rehearsed practice in general use, I take great pleasure in commending to the favorable notice of medical men, an article commonly known as "aqua regia," or "nitro-muriatic acid," against which nothing can be said, and over which no remedial agent that I have yet tried can justly be lauded, either as a more *safe* or *effective* remedy in arresting phagedænic ulceration. It does not require an expert to use it, whilst the slough it creates scarcely amounts

to a pellicle, which when detached exposes a granulating surface of surpassing beauty and reparative powers. I have had such immense success with this practice, that I am almost tempted to say, in the event of a failure after its use, that it would be solely owing to a want of *thorough application*. To do this, all the deep grooves, canals and sinues of the ragged ulcerative tissues should be well *opened up* and *most vigorously sponged* and *dried out*. The undermined integument should be cut through with a pair of sharp scissors at different points of the circumferential line, and well up against the connective tissues, so that it may be turned over like a cuff and well cleansed. After these precautionary steps, which are never to be omitted, the case is ready for the reception of the acid. To do this with facility, a half dozen small pieces of sponge, a polypus forceps, and a small saucer containing the aqua regia *just made*, should be ready for the surgeon the moment he has finished drying the wound, else it will again become humid and thus weaken the acid or compromise its efficiency. The ulcer should be gone over again and again with a fresh sponge newly dipped into the acid, till it becomes dry throughout its entire extent. Lint should now be placed in the wound, and kept moist with alcoholic or stimulating lotions, changing the lint twice a day.

The following are very good medications:—*R.* Pulv. opii, ʒ ss.; creasoti, ʒ ij.; spts. frumenti, Oij. M.; or, *R.* Acid. muriat., ʒ i; sodæ chlorinat., ʒ ij.; aquæ, Oiss. M., will be found to answer extremely well. These cases should have tonics and be well fed; in fact, they make a vast change in the course of twenty-four hours after completely recovering from the effects of the chloroform, so that they lose their previous anorexia and acquire a very good appetite. Porter and nourishing food will hurry them into vigorous convalescence.

In regard to the treatment to be adopted in the form of rapidly extending mortification, or acute hospital gangrene, little can be said by way of commendation. I have amputated four times in this hideous form of the malady, and lost three of my patients; two from recurrence in the stump, the other by pyæmia. The case of recovery happened in an old fat minister, who was a private patient. Still, if the patient had sufficient strength to rally from the shock of the amputation, I would have courage to use the knife again, if it carried with it only a forlorn hope. If it be not too large a surface, I believe it would be good practice to completely excise the parts till blood flow from every portion of the wound, then burn it with red hot iron, or other powerful caustic.

The low ulcerative action which sets up in long or deep sinuous wounds, has already been alluded to. They should be *boldly opened up* with a bistoury and treated with acid; otherwise the patients are very apt to die—die in spite of iron, quinine and whiskey.

Washington City, Sept. 22d, 1864.

W. H. TRIPLETT.

## DR. GAILLARD'S PRIZE ESSAY ON OZONE; ITS RELATIONS TO HEALTH AND DISEASE.

[Continued from page 181.]

WE see thus that, by the simple process of ebullition, any possible preparation of nitric acid can be made to acquire this prescribed specific gravity; the strong acids rise to it, and to it the weak acids fall. There can, then, be no difficulty in regard to the acid. We have, then, iodide of potassium pure; nitric acid of exactly 1.42 specific gravity; and distilled water. Distilled water, for this purpose, should be pure; and to secure this, it should be tested. Pure distilled water should be transparent and colorless; it should not smell or taste of burnt oil; it should not change the color of blue or red litmus paper. When slowly evaporated to dryness, in a platinum or glass capsule, it should leave no solid residue. It should not become turbid, when tested, separately, with solutions of nitrate of silver, nitrate of barytes or oxalate of ammonia. It should be recollected that rain water, as containing nitric acid, should not be used as a substitute.

With a perfectly pure preparation of the iodide of potassium, with nitric acid of specific gravity 1.42, and with pure distilled water, we have the materials for constructing an ozonometer, securing all the necessary qualifications now desired. The first step, in this process, is to prepare a substitute for an ozonized atmosphere, and, in this, acid must play the part of ozone:—*R.* Aquæ dist., f 3 vij.; acid. nitric. (1.42), f 3 ss. Misce. Each quarter drachm, or fifteen minims, of this mixture will contain one minim of nitric acid. Into each of ten (10) clean glass vessels (wineglasses), pour one fluidounce of pure distilled water. Of the mixture of acid and water, just prepared, pour into the

1st glass	-	-	-	10 minims	6th glass	-	-	-	35 minims
2d "	-	-	-	15 "	7th "	-	-	-	40 "
3d "	-	-	-	20 "	8th "	-	-	-	45 "
4th "	-	-	-	25 "	9th "	-	-	-	50 "
5th "	-	-	-	30 "	10th "	-	-	-	55 "

It will be observed that each of these glasses represents the atmosphere, in a certain ozonic condition; for the solution, in each glass, will produce the same change in an ozonoscope, as would an atmosphere containing a corresponding amount of ozone. Each glass, then, represents an atmosphere containing a certain amount of ozone, and each glass shows the relative action of such an atmosphere upon the ozonoscope. A perfect white being the zero of the ozonometer, the glass containing ten minims of acid and water in the solution represents an atmosphere which would, in an ozonoscope, produce a color indicated by the degree 1 (one) on the ozonometer—and so, respectively, with the other glasses; the last, containing fifty-five minims of acid and water in the solution, representing an atmosphere which would, to the ozonoscope, give hue or degree 10 (ten) of the ozonometer.

Into each of these glasses, plunge an ozonoscope of cotton cloth, prepared as before mentioned. Each ozonoscope may be of any convenient dimensions; three inches long and one inch wide will answer. Allow them to remain fifteen minutes *each*, and removing them in order, place them away to dry. These ozonoscopes should be numbered, to correspond with the glasses in which they are placed. It is best that *only one at a time* should be used, and the entire process with this completed before another is attempted. As the hue of the ozonoscope is not permanent, it is necessary that the hue resulting from the action of the acidulated water, should be *immediately* transferred to paper. A few minutes before making this transfer of the hue to paper, the ozonoscope, about being so imitated, should be slightly dampened with a little *distilled water*. In making this chromatic imitation of the ozonoscopes, the same pigments should be adopted, as are now used in making this division arbitrarily; Prussian blue, neutral tint, India ink, &c. Any ordinary painter, or person of common ingenuity, will easily and readily succeed in making a perfect imitation of these ozonoscopes. It is certainly more easy to *imitate* these colors, than to *create* them, and instead of making a rude and inaccurate division of the chromatic interval, from white to blue, we have, in this series of imitations, a uniform and perfect ozonometer. We have not to *make* the chromatic divisions, for this is already done; we have not to *create* a chromatic degree, but are only called upon to *imitate* one. The only possible obstacle, in the formation of this ozonometer, is the imitation of the chromatic tints of the ozonoscopes; and *if* this prove an obstacle, how would it be exaggerated and increased, if, in place of *imitating* these hues, we had to first *create* them, and then to establish a *uniform* scale of degrees between them. It should be recollected, that it removes entirely all the uncertainties and dissimilarities which characterize the present ozonometers, and transforms the difficulties of *chromatic creation*, to those which *may* attend those of *chromatic imitation*. Such as it is, however, it is offered for consideration and we hope for adoption.

There need be no prescribed form or size for this ozonometer, but it will be found convenient to have the degrees, or chromatic divisions, as delineated on paper, about four inches long and one inch wide; the first division being marked 1, the second division 2—and so on, until the degrees are all completed—zero being white. It should be observed here, that a given amount of ozone, or any acid, produces a greater effect on the ozonoscope, when this is dampened, than if it were dry. The ozonoscopes placed in the glasses are therefore more deeply colored, than if the same amount of acidity acted upon them in a dry condition; though the hues actually produced, correspond in intensity with the hues that are actually produced by atmospheric ozone.

It is necessary that, in the use of the ozonoscope, it should be

dampened both at the commencement and close of each experiment. The ozonoscopes moved by clock work, are kept always dampened by capillary action, or some other simple method. We here annex a few specimens cut from the ozonoscopes, illustrating the condition of the atmosphere at various places upon this continent. (Owing to the peculiar tints required, they cannot be given by letter-press.)

The ozonoscopes should be dampened with a little *distilled* water. It will be observed, that the condition of atmospheres, so near each other, is often, at the same time, very dissimilar.

There are some peculiarities which should be observed, in exposing ozonoscopes; as otherwise the results obtained and the deductions from them will be erroneous. We will state these as concisely as possible. The ozonoscope should be dampened at the commencement and close of each experiment or observation; it should not be placed where it would be affected by ammoniacal gases; all alkalies destroy the color of the blue iodide of starch. After a thunder storm, in consequence of traces of nitric acid in the atmosphere, the ozonoscope manifests a deep blue color; allowance should always be made for this. The ozonoscope should not be exposed to a strong current of air or wind, as this produces a sensible evaporation of the iodide of starch. When exposed at great height in the atmosphere, as on a steeple, there will be a very slightly deeper color than when exposed on the ground, at the same locality. Height gives a relative increase in the amount of ozone. Lastly, the ozonoscope should not be exposed in a chamber, or room occupied at any time during the twenty-four hours; for the circumstances attending habitation influence the formation of ozone and tend to its destruction. The meteorological relations of ozone have received close investigation, but without going into the details, specially interesting only to those making this their study, we will briefly state the results.

Winds influence ozone, according to the quarter from which they come. In America, according to careful investigation, Easterly and Southerly winds are attended with an increase of ozone; Westerly and Northerly winds seem to have no uniform, or decided effect. In Europe, Westerly winds (as coming from the sea), always coincide with our increase in the amount of atmospheric ozone. Rain, hail and snow are marked by an increase of ozone; extreme cold also produces a similar effect. Dry air is unfavorable to the formation and existence of ozone; damp air exerts a contrary effect. Bæckel observes, that the rapid formation of vapor is attended with an increase of atmospheric ozone. Sunlight is a prime necessity in its formation. Temperature has its effect: as cold is favorable to the formation of ozone, so heat is inimical to its existence; at the degree of heat, before specified (268 F.), ozone is entirely destroyed.

These brief facts on this subject, compiled from a mass of tables and statistics, exhibit all that is certainly known of the meteorological relations of ozone. It is not yet finally determined at what pe-

riod of the twenty-four hours the maxima and minima of ozone are exhibited. Boeckel, one of the best European authorities, states that, in summer, the ozonometric mean is greatest in the day; the ozonoscope being, in the day, exposed to two maxima of electricity. European writers on this subject are divided in their opinions and views; the law has yet to be established. Dr. Smallwood, of Montreal, concludes "that the ozonic periods correspond, in a striking degree, to the bi-daily variations of atmospheric humidity." The same authority quite recently suggests that "there are certain hours of increase and decrease, corresponding to the bi-daily variations of the barometer, and apparently with the variations of atmospheric electricity."—(Autograph letter, 1861.) Statistics alone, based on good and uniform instruments, can establish the law.

[To be continued.]

#### ON THE ARSENIC-EATERS OF STYRIA.

BY CRAIG MACLAGAN, M.D., EDINBURGH.

IN the spring of this year, at the conclusion of a short residence in Vienna, I resolved to visit Italy, and finding that my route led me through Styria, I thought it might be interesting to endeavor, by personal inquiry, to gain some information as to the reputed arsenic-eaters of that country; and as my travelling companion, Dr. Joseph Rutter, of London, was also professionally interested in the question of their existence, we determined to make a short stay at Gratz, the capital of the duchy, and thence to make any excursions into the country, which the knowledge I might acquire should point out as necessary.

My object in the present paper is succinctly to narrate what I learned by actual observation; but before doing so I may be permitted to glance rapidly at the existing condition of our information on the subject.

Although medico-legal observations on this practice had already been made so early as between 1817 and 1820 (Professor Schallgruber, *Medecin-Jahrbuch des Oestreich. Staates*, 1822) in Gratz, the first time that any great interest was manifested in Britain on the subject seems to have been when a paper by Dr. Von Tschudi, which had originally been published in one of the Viennese medical journals (*Wiener Medicinische Wochenschrift*, October 11, 1851), appeared in an English dress, and found its way into many of the popular as well as scientific publications of the time, including Chambers's Journal, and the late Professor Johnston of Durham's *Chemistry of Common Life*.

The embellishments which Von Tschudi's narrative received from other writers, as well as the apparently incredible nature of the original statement, caused it to become a subject of much discussion.

The general opinion of scientific men in this country was, that the statements of Von Tschudi were not worthy of belief, and this view of the subject was specially maintained by Mr. Kesteven, of London, in a series of papers which appeared in the Association Medical Journal for 1856, in which he quotes the opinions of the most celebrated toxicologists of the time, in confirmation of his own disbelief in the practice.

Careful inquiry, however, was set on foot by other scientific men, both British and Austrian. Mr. Heisch, of the Middlesex Hospital, having put himself in communication with persons living in the districts where the practice existed, was enabled to quote several very interesting cases, which were very thoroughly authenticated (*Pharmaceutical Journal*, 1859-60, p. 556), and Dr. Von Vest, the Landesmedicinalrath for Styria, residing in Gratz, having issued a circular to the medical men in his district, asking for information on the subject, was enabled also to arrive at tolerably satisfactory proof of the existence of the custom. The most interesting example of it was communicated to him by Dr. Knappe, then residing at Oberzeiring, in Upper Styria, who had persuaded an "arsenikophagite" to come and live under his observation for a few days, and who not only was thus enabled to see the man take his dose, but was enabled to transmit to Dr. Schäfer, a practical chemist in the Styrian capital, a specimen of the urine passed after the ingestion of the drug, and which was proved to contain it.

The facts ascertained by Knappe were made known in Britain, by a paper by Dr. Roscoe, read to the Manchester Philosophical Society, and published in the *Mechanics' Magazine*; and the existence of the practice has been admitted by some scientific men who have written since the date of Roscoe's paper. Dr. Guy (*Forensic Medicine*, 2d Edit., p. 368) admits that Roscoe has brought forward "conclusive evidence" of the fact; but from its being denounced as incredible in most of our standard works which have occasion to treat of the subject, such as those of Taylor and Pereira, and from its having been strongly denied in some important criminal trials, as by Dr. Christison in the case of Wooler (*Edinburgh Monthly Journal*, 1855-56, pp. 709, 710); whilst Roscoe's valuable paper appears not to be sufficiently known, it seems to be the general belief in this country that there is no foundation in fact for the alleged arsenic-eating in Styria.

What seemed to result from the inquiries of Von Tschudi, Knappe and Heisch, was this:—

I. That in various parts of Styria and the adjoining countries certain individuals were in the habit of swallowing daily, or twice or thrice a week, or at longer intervals, a certain quantity of a mineral substance, called "*Hüttereich*,"\* for various purposes, such as the

\* I use the spelling adopted by Dr. Macher in his *Medizinisch-statistische Topographie Steiermarks*. Although the pronunciation of the Styrians makes it *Hotrach*, it is obvious that the word really is *Hotten-rauch*—literally, furnace smoke or vapor.



improvement of the appearance, the rendering more easy the respiration during mountain climbing, as a condiment, as a tonic and stimulant, as a prophylactic against disease, and as a preservative of health; and that this so-called Hüttereich was arsenic.

II. That these individuals became, through custom, capable of taking doses of arsenic varying from one grain to several grains daily.

III. That its more immediate effect on the system was to make them lively, combative, and of strong sexual desire. This latter physiological effect may perhaps be held to be indirectly proved by the inordinate number of illegitimate children in some of these places, the proportion sometimes rising nearly as high as 60 per cent. of the total births.

Against all this was to be placed—

I. The experience of medical men in other countries, who have found that by the continued use of arsenic as a drug, even in fractional parts of a grain, certain consequences arose directly contrary to those experienced by the partakers of it in Styria.

II. The want of proof by analysis that the substance said to be taken was really arsenic; the absence of any chemical examination of the excretions of an arsenic-eater, so as to prove that arsenic really had been swallowed; the want of any account of its effects when first begun to be used; or of any information as to the origin of the custom.

Most of these objections, however, have been removed by the investigations of Drs. Knappe and Heisch, to the former of whom I am indebted for much interesting information on the subject.

It is not at all surprising that in other countries there should be a prevalent impression of the non-existence of this practice in Styria, seeing that in Austria itself those who have not made special inquiries on the subject are generally sceptical as to it. Any one, therefore, passing through Austria and making casual inquiries, would most likely be told that the practice of arsenic-eating was not generally known or believed in. It is not difficult to account for this. The people who eat arsenic have the idea that it is regarded as a bad habit, and therefore one to be concealed as much as possible, just like opium-eating in this country; and they have the additional reason for concealing the practice, that from the strictness of the laws regarding the sale of poisons, they cannot get the arsenic by open purchase, as the opium-eater in this country can get his laudanum, and therefore they are generally obliged to purchase it from illicit dealers.

I now proceed to narrate what I have myself ascertained by personal observation. Though without an introduction to him, I called on the Medicinalrath, Dr. Von Vest, who, on learning the object of my visit, with great courtesy put at my command any papers that his office contained, and, in addition, supplied me with introductions

to Drs. Knappe, Macher, and Tingler, the two former of whom I was fortunate enough to see, but I was unable to spare time to see Dr. Tingler.

Dr. Macher, now resident at Stainz, who is thoroughly acquainted with all the medical matters of Styria, and whose experience during a long period of active professional work there, makes his opinion of no small value, informed me, that, although cognizant of the existence of the practice, he had little personal experience in the matter. He related to me, however, one case, in which a woman, who had been tried for poisoning her husband with arsenic, had been acquitted, from "want of evidence," the plea for the defence being that the man had been an arsenic-eater. Though this defence was generally believed to be false, it shows, at all events, that the practice has in a court of justice been admitted to exist, and has served, in at least one instance, as a successful ground of defence.

Dr. Knappe, of Liegist, in Middle Styria, an hour's journey from Gratz, was my next informant; and when I first spoke with him of the case of J. W., already alluded to as the subject of experiment, and whose urine had been examined by Dr. Schäfer, he described him as a small, strongly-built man, with a great muscular development, a wood-cutter by trade, who had taken the drug for a period of twelve years. Dr. Knappe further stated to me that while personally ignorant of the actual existence of an arsenic-eater in the neighborhood, he could go with me to Upper Styria, and show me the above man, but he suggested that we should first make inquiry in the village, whether or not any of those persons described to him as indulging in the habit could not be got to take a portion of it before me. I accordingly slept in Liegist that night, and next morning I had the satisfaction, in presence of Dr. Knappe and my companion Dr. Rutter, of having my first interview with an arsenic-eater.

CASE I.—Mathias Schober, a healthy-looking, fresh-complexioned, fairly muscular young man of the age of 26 years, and about 5 feet 9 inches in height, a native of Liegist, and employed as a house-servant there, said he had taken hüttereich for about a year and a half, not, however, white arsenic, but the yellow arsenic or orpiment, of which he took a specimen from his pocket and showed it me. Of this I retained a piece for chemical investigation. He informed me that he took the arsenic in order to keep strong, though he had never suffered from ill health. He said he had never experienced any bad effects, even when he first began using it, that he had at first taken rather less than a grain every fortnight, that he now took it twice a week, and that on omitting to take it for any longer period, he experienced a longing for it, which was relieved by a repetition of the usual dose. His reason for taking the orpiment instead of the white arsenic was, that it was more easily procured;

but having professed himself quite indifferent whether it were arsenious acid or the sulphuret, Dr. Knappe produced a paper containing the former (of which I also kept a sample), and having asked him to choose out a piece such as he was in the habit of taking, it was weighed and found to be nearly five grains; we had no finer weight than one grain, but the piece of arsenic was much over four, though less than five. Dr. Knappe, having carefully ground this to powder on a clean piece of paper, it was transferred to a small piece of plain white bread, about as large as a man's thumbnail, and this the doctor put into his mouth; Schober chewed it and swallowed it, and then swallowed another portion of bread the same size immediately after. This was at 9.30, A.M. He stayed with us a few minutes, but he had to return to his work, promising, however, to come back in a short while. This he did at 11.30, two hours after, and made water in my presence to the amount of what I estimated at twenty-eight ounces, into a vessel previously carefully cleaned, and the urine was put into bottles thoroughly washed by myself. Unfortunately, in the hurry of my departure, in trying to pack these bottles into my hat-box, I broke one, and thus lost part of the urine. Since my arrival in this country, I subjected the contents of the two remaining bottles to chemical analysis, adopting the distillation process of Dr. Taylor as the most convenient way of separating arsenic from the organic matters of the urine. For this purpose the urine was carefully evaporated to dryness in a clean retort; the nearly dry residue was covered with strong hydrochloric acid, and distilled into a well-cooled receiver. The product, amounting to about half an ounce, was a clear, feebly pinkish fluid, thirty minims of which, when treated both by Reinsch's and Marsh's process, gave very characteristic arsenical deposits.

Schober also came the following day to see me, having taken no more arsenic since the dose which he had swallowed before me twenty-six hours previously. I again secured some urine which he passed in my presence, and this, when chemically examined as above, also yielded arsenic freely.

CASE II.—Joseph Flecker, æt. 46, a muscular, healthy-looking, clear-complexioned man, a tailor by occupation, told us that he had taken hüttereich, generally the orpiment, for a period of fifteen years. He first began to do so on the occasion of the inhabitants of a house, in the neighborhood where he lived, being attacked with fever; and when fourteen people had died in it, and no one would enter the premises, he determined to do so, and took, as a prophylactic, about one grain of arsenic daily for three successive days, while going to the infected house, and though he said he had not felt quite well at the time, he was unable now to describe specially what had ailed him; but on being asked if he had ever suffered from vomiting or irritation in the stomach, he said he had not.

The day before my interview with him, he twice, viz., at 10.30

and 3 o'clock, had, in the presence of several of the villagers of Liegist, and on one of those occasions in presence of the burgermeister, who informed me that he had seen him do it, taken a piece of the sulphuret of arsenic from his pocket, and scraped off a certain quantity of it on a piece of bread and eaten it. He brought with him a small bottle of his urine, which he stated to have been passed eighteen hours after the last of the two doses, and in which I have since found a considerable quantity of arsenic. The reason which he assigned for this public exhibition of his arsenic-eating capacities was, that it had become the subject of conversation in the village that two strangers had come a very considerable distance to witness an example of arsenic-eating, and inquire into the practice, and that he wished to make open demonstration of his assertion that he was capable of tolerating a considerable dose of arsenic. When he first came to me he seemed somewhat unwilling to take a dose that day, owing to his previous performance, and seemed to fancy it possible that he might have some slight irritation of the stomach, such as a feeling of warmth accompanied by thirst. He did not appear to be able to give any reason for anticipating this result; perhaps he intended it as a gentle hint that the thirst might require assuaging; at all events, having been informed that he should not want the wherewithal to quench it—(he confessed to being by no means abstemious in the matter of alcoholic potations), he, to satisfy our curiosity, picked out a piece of arsenious acid, from the same parcel that had been shown to Schober, and which, on being weighed, was found to be as nearly as possible six grains. This he placed entire on a small piece of bread, and taking it into his mouth, crunched it up audibly, and in about two minutes after swallowed six or seven ounces of cold water, stating that he liked to drink immediately after swallowing a dose, and on such occasions preferred water. I then made him open his mouth and inspected it narrowly, but found it quite clear of bread crumbs or anything else, thus assuring myself that no jugglery could have been practised. After having swallowed the arsenic four minutes, he eructated slightly, but till he left us, a quarter of an hour after, he had no symptoms of any bad effect. The six grains were taken at 11.30, and at 12.15 he returned, and passed a small quantity of light-colored urine. Nearly the whole of this was bottled for exportation, and the twelve ounces thus secured were treated by the process of distillation above described, and also yielded a characteristic deposit of arsenic.

Flecker gave me the following account of his use of arsenic. He stated that he generally takes about the quantity we saw him swallow once a week, but with variations in the intervals, there being sometimes four days only, sometimes eight days between the doses. That when he has a distance to walk to his work, he takes a larger dose, and is then in good spirits for about eight days. That if he,

however, intermits it for fourteen days, he feels stiff in the feet, with general lassitude and a craving for another dose. If his victuals are hard of digestion, he takes a dose to assist the stomach, and if he takes a rather full dose, he brings a good deal of wind off his stomach, but never vomits. He stated that his father had taken arsenic before him, and in considerable quantity, and that in the immediate neighborhood of Liegist numbers use it, several taking it daily, and many in larger doses than he. He said that all who take it are healthy—that he never knew of any one vomiting from its use, and he believed that, like the use of tobacco, if the dose is very gradually diminished, an arsenic-eater can break himself of the habit.

One of the objections which has been made to the acknowledgment of the reality of arsenic-eating is, that the substance swallowed has not been ascertained by chemical examination really to be arsenic. This link in the chain of evidence I am able to supply. The white substance which I saw Schober and Flecker swallow, part of which I have now in my possession, is pure arsenious acid. It sublimes into octohedral crystals, and leaves no appreciable residue. The yellow substance which Schober used is a fair sample of the orpiment of commerce, and contains, as that substance usually does, a considerable portion of free arsenious acid.

I am, of course, not in a position to give any opinion as to the extent to which arsenic-eating prevails in Styria—my time would not have permitted me to enter upon such an inquiry, nor would it be easy to get satisfactory information as to a practice which is generally kept secret; confirmation of the fact of its existence is more interesting to us scientifically than its extent; and that it is a fact, my personal observation enables me confidently to affirm. That arsenic-eating in Styria is a universal habit, or one indulged in by even a majority of the male peasantry, I do not for a moment suppose; but the averment "that the story of the Styrian arsenic-eaters is not only unsupported by adequate testimony, but is inconsistent, improbable, and utterly incredible"—(Kesteven, *Asn. Med. Journal*, 1856, p. 811); or that these are "absurd and exaggerated statements, utterly inconsistent with all that is known concerning the action of arsenic in this or other countries, and but for the fact that they for a time received the literary support of Professor Johnston, and were diffused by him in an amusing book, they would not have required any serious refutation"—(Taylor, *On Poisons*, 2d Ed., p. 92); or that it is a "mess of absurdity," "a pure fable"—(Christison, *Edin. Med. Jour.*, 1855-56, pp. 709, 710), are, although justified by the state of knowledge at the time they were made, no longer tenable; but, on the contrary, we can no longer doubt, to use nearly the words of Roscoe, "that decisive evidence has been brought forward not only to prove that arsenic is well known and widely distributed in Styria, but that it is likewise

regularly eaten in quantities usually considered sufficient to cause immediate death."

It is probable that many of the physiological actions attributed to it are fanciful, and that its use is mixed up with a good deal of superstition, as, for example, in the case of the poacher who takes it to give him courage to pursue his depredations on ground that is new to him, or that of the ostler who, in giving it to his horses to improve their coats, thinks that it will have no beneficial effect unless he partakes of it at the same time.

It is evident that the confirmation of the existence of the practice of arsenic-eating must lead us to modify some of the opinions that are entertained with regard to the influence of habit on the action of poisons. It has long been notorious, that by habit the human body may be brought to bear with impunity doses of organic poisons, such as opium, which, to those unaccustomed to them, would certainly prove fatal; but "it has hitherto been considered by toxicologists that, except within very narrow limits, habit appears to exercise no influence on the action of mineral poisons"—(Taylor, *On Poisons*, p. 89). Though the experiments of M. Flandin, by which he proved that he could bring dogs to bear fifteen grains of arsenious acid in powder in twenty-four hours without injury to their appetite or health, and the practice of administering arsenic to horses, have long been known as pointing rather in the contrary direction, this has been supposed to be due to some peculiarity in the constitution of the lower animals. The facts which have been ascertained with regard to the Styrian arsenic-eaters, and which the above observations confirm, entitle us to maintain that the modifying effect of habit is not confined to organic poisons, but extends to those of mineral nature, at all events to arsenic.—*Edinburgh Medical Journal*.

---

## THE BOSTON MEDICAL AND SURGICAL JOURNAL.

---

BOSTON: THURSDAY, OCTOBER 6, 1864.

THE UNITED STATES SANITARY COMMISSION IN ENGLAND.—We have read with much satisfaction a little pamphlet recently published in England, and which has reached its second edition, under the title, *A Woman's Example: and a Nation's Work. A Tribute to Florence Nightingale*. The object of the anonymous author is to enlighten the English people with regard to the nature and operation of our great National Commission, with the hope of enlisting the sympathies and obtaining the substantial aid of his countrymen in forwarding its gigantic and beneficent task. Our nation has received, during the last four years, so little sympathy from the mother country, at least as expressed by the public press—such pains have been taken by our

enemies to blacken our national character in the eyes of the English people, that during this time an American could hardly find a less congenial spot on earth than that island, which has heretofore boasted itself as the foremost friend of the cause of freedom and justice the world over. There has been such a spirit of unfairness in this from the first, that the natural wish to set ourselves right in the eyes of that nation has been almost displaced by the universal feeling of indignation to which it has given rise; and we have felt little disposition to say more than "let the unjust be unjust still." Of course we would not overlook the shining exceptions to the common feeling, of the few men who have so earnestly striven to uphold our cause in a hostile community, and have so bravely made good, in their own persons, the traditional ideas of British honor and British justice. As one of the valuable fruits of this friendly spirit, one which is calculated to convey to its readers on the other side of the water not only a just impression of some of the humane and Christian aspects of our war, but information of much practical value, we hail with great pleasure the publication of this little pamphlet.

The author very naturally begins with a graceful dedication to Florence Nightingale as the founder of organized movements by civilians to soften the horrors of war by bringing the sympathies and many of the comforts of home to the battle-field and the military hospital. A slight sketch of Henri Dunant's scheme for a general European Sanitary Commission follows, and then in the second chapter he takes up that of our own country. Adverting to the belief in Europe that our great struggle was but a dreary chronicle of bloodshed, ruin and despair, he says:—"Strange that the evil should all be known, and only the good remain concealed! Yet amid all this wide-spread desolation, true hearts have beaten responsively to the cries of woe; and loving women and noble men have achieved a work which Europe never has attempted on such a wondrous scale. As Englishmen, we must take pride in their success, for are not these Americans our own flesh and blood? and have they not profited in their labors by the example set before them in the Crimean and Indian wars?"

The pamphlet then goes on, through ninety pages, to give a succinct and methodical account of the organization and practical working of our Sanitary Commission in all its details, so that no one can rise from its perusal without a very favorable impression of the wisdom and humanity which founded it, and the liberality which has heretofore never failed to answer its calls for aid. Strained to the utmost, however, as our national energies have been, and drawn upon to an unprecedented extent as all our resources have been, the author makes an appeal to the British people to help us at the present time. And although we do not ask such assistance, and have not the shadow of a doubt that the American people will sustain our National Commission to the last man and the last dollar, yet as an expression of sympathy from a source from which we had almost come to look for little else but injustice and revilings, such a contribution would do something towards effacing the impression which we fear long years alone can obliterate. The author concludes as follows:—

"Such are, curly and most poorly told, the results of the labors of the Sanitary Commission of the United States. That Commission has really been throughout this war the agent of the American people,



who, to enable it to carry on its wonderful labor of love, have imposed upon themselves an enormous voluntary tax, ever increasing yet ever gladly given. Unfortunately, benevolence in this world is oft-times limited in its action by incapacity of means, and the Committee is now making urgent appeals for additional support.

"Shall such a noble undertaking fail, after having achieved so much? No appeal has ever yet been made by its managers to European nations, nor is any likely to come from them; but is it right for us as *men*, children of a common family; is it right for us as *Englishmen*, brothers of the same race, to allow this noble work to fail for want of aid which we can offer? Thousands of the subjects of our beloved Queen are in the ranks of those contending armies, and every nation in Europe has suffering and wounded men there, who, like our own, are receiving the ever present ministrations of this untiring Commission. Can we—after America's beneficence to Ireland and Lancashire—can we refuse to lend a helping hand to a work so nobly instituted and so ably carried on?"

---

**FEES FOR MAKING AUTOPSIES IN CASES OF LEGAL INVESTIGATION.**—We are authorized to state, as the result of a decision of the Court of Suffolk County on the fees for autopsies when ordered by a coroner, that for an ordinary autopsy \$30 will be allowed instead of \$20—the old fee. But whenever there are circumstances of unusual responsibility, or involving much loss of time in testifying, &c., that a proportionate compensation shall be paid, up to the fee of the new fee table, viz., \$50. This action has just been taken on the claim of a member of the Boston Medical Association for making an autopsy, wherein the new charge of \$50 was handed in to the District Attorney.

---

**EXPULSION OF TAPE-WORM.**—Dr. S. A. Skinner, of Hoosik Falls, N. Y., furnishes us with the following case of expulsion of tape-worm by the use of pumpkin seeds, which occurred in his practice a short time since:—

Mrs. D., aged 23, a native of Ireland, has been in this country six months; has been out of health the last two years. About the first of August last she passed three yards of tape-worm without any previous medication. She then applied to a physician, who treated her three weeks without success. On the morning of Sept. 1st she called at my office. I requested her to omit her dinner, supper and breakfast, and to take the following prescription. Three ounces of pumpkin seeds, previously peeled and pulverized and mixed with one pint of milk; one half to be taken at bedtime, or at 10 o'clock, P.M., the remainder early in the morning. In two hours after taking the last half, to take one ounce and a half of castor oil. I made her a visit in the morning, previous to her taking the oil; the pumpkin seeds had operated as a brisk cathartic, but none of the worm passed. She then took the oil, which operated in less than one hour and brought away a part of the worm; in a short time the remainder came away. My patient is now convalescent, with a good appetite. The worm, which I have in my possession, measures 66 feet.

**TREATMENT OF NÆVI MATERNI BY THE SUBCUTANEOUS INJECTION OF SOLUTION OF PERCHLORIDE OF IRON.**—Mr. Robert B. Carter reports, in the *Medical Times and Gazette*, a second case of death following this operation, which has been communicated to him by Mr. Nathaniel Crisp, of Swallowfield. A *post-mortem* examination showed that the point of the syringe (the nævus being on the cheek) had penetrated the transverse facial vein, and that the blood in the right cavities of the heart had been immediately coagulated. Mr. Carter concludes with the remark, that he feels justified in saying that the subcutaneous injection of perchloride of iron should not be practised, unless it is possible, by pressure with fingers or forceps, by acupressure or even the temporary application of ligatures, to close for a time the channels of the efferent veins; where this can be done, the remedy is free from danger, and will usually be effectual; but without such a precaution it entails so much risk to the patient that only the most exceptional circumstances would permit him to advise or employ it.

**DR. V. J. FOURGEAUD**, Editor of the *Pacific Medical and Surgical Journal* for the last two years, resigned his position on the issue of the August number. He complains of not having had the "harmonious support and co-operation of the profession generally."

**Dr. Robert Bartholow**, late Assist. Surg. U. S. A., having resigned his position in the army after a service of seven years, has entered into private practice in Cincinnati, Ohio.

Messrs. Lippincott & Co., of Philadelphia, have in press a new edition of Wood & Bache's United States Dispensary.

**B. Frank Palmer, Esq.**, so well known as the inventor of the Palmer Leg and Palmer Arm, has recently had conferred upon him the degree of Doctor of Laws by the Western University of Pennsylvania.

As a product of the secretion of the kidney, a new acid of a colloid character has been described by Dr. Marcet. It consists only of carbon, oxygen and hydrogen, being poor in the last element and rich in the first. Its quantitative analysis has not yet been made; but it is thought that it originates in the transformation of one of the non-nitrogenous constituents of the liver known as glycogenic substances.

#### VITAL STATISTICS OF BOSTON.

FOR THE WEEK ENDING SATURDAY, OCTOBER 1st, 1864.

##### DEATHS.

	Males.	Females.	Total.
Deaths during the week	60	47	107
Ave. mortality of corresponding weeks for ten years, 1853-1863,	50.7	41.0	91.7
Average corrected to increased population	00	00	100.51
Death of persons above 90	0	0	0

**DEATHS IN BOSTON for the week ending Saturday noon, Oct. 1st, 107.** Males, 60—Females, 47.—Accident, 7—apoplexy, 2—disease of the bowels, 1—inflammation of the bowels, 3—congestion of the brain, 1—disease of the brain, 4—bronchitis, 1—cholera infantum, 5—consumption, 12—croup, 4—diarrhoea, 4—diphtheria, 1—dropsy, 1—dropsy of the brain, 2—dysentery, 9—entero-colitis, 1—exhaustion, 1—bilious fever, 1—scarlet fever, 1—typhoid fever, 5—typhus fever, 1—gangrene, 1—gastritis, 1—disease of the heart, 4—disease of the hip, 1—infantile disease, 2—disease of the kidneys, 1—congestion of the lungs, 1—disease of the lungs, 1—inflammation of the lungs, 5—marasmus, 2—measles, 1—old age, 1—paralysis, 2—smallpox, 2—teething, 1—convulsions, 5—syphilis, 1—unknown, 8.

Under 5 years of age, 38—between 5 and 20 years, 11—between 20 and 40 years, 26—between 40 and 60 years, 20—above 60 years, 12. Born in the United States, 64—Ireland, 33—other places, 10.